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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,181	09/10/2003	Greg E. Howard	TI-36332 (032350.B531)	7485

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EXAMINER

CLARK, SHEILA V

ART UNIT PAPER NUMBER

2815

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 10/659,181	<b>Applicant(s)</b> HOWARD ET AL.	
	<b>Examiner</b> S. V. Clark	<b>Art Unit</b> 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-20 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-14 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 5, 7, 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohno et al.

Ohno et al shows in for example figures 9-11 providing a substrate 40 having a plurality of through holes 24 formed therein with each hole associated with a plurality of contact pads 2 in the form of leads 2 formed on a first bottom surface. A plurality of balls 6 are taught disposed within ones of the plurality of holes and projecting outward from said first surface (Figure 10B). A force 53 (a press) is shown in figure 10 applied to each of the balls outwardly from the first surface to couple the balls to the substrate 40 (figure 10D).

Col. 11, line 31 describes substrate 40 as being formed of a pile of layers would have been to one having ordinary skill in this art to be obviously describing a laminate, used common in semiconductor substrate technology.

Figure 10C shows said formed applied to each of said balls (simultaneously) and a press tool is taught wherein press may be used interchangeable as a punch and as pressing tools may punch.

It is taught that that said balls are pushed through a substrate such that a portion extends outside said through hole. As the balls are taught to have a diameter of 90 the

holes 80 and the substrate 40 micrometers it would seem that there would be some overlap of the protruding portion of the balls relative to the substrate.

Col. 12, line 34 teaches that said ball may project outwardly by a distance of 45 microns in the range recited in claim 4.

Claims 9, 11-14 are rejected under 35 U.S.C. 102(b) as anticipated by Ohno et al.

Ohno et al shows in for example figures 9-11 a substrate 40 having a plurality of through holes 24 formed therein with each hole associated with a plurality of contact pads 2 in the form of leads 2 formed on a first bottom surface. A plurality of balls 6 are taught disposed within ones of the plurality of holes and projecting outward from said first surface (Figure 10B). A force 53 (a press) is shown in figure 10 applied to each of the balls outwardly from the first surface to couple the balls to the substrate 40 (figure 10D).

Figure 10C shows said formed applied to each of said balls (simultaneously) and a press tool is taught wherein press may be used interchangeable as a punch and as pressing tools may punch.

It is taught that that said balls are pushed through a substrate such that a portion extends outside said through hole. As the balls are taught to have a diameter of 90 the holes 80 and the substrate 40 micrometers it would seem that there would be some overlap of the protruding portion of the balls relative to the substrate.

Col. 12, line 34 teaches that said ball may project outwardly by a distance of 45 microns in the range recited in claim 11.

The claims contain method of making characteristics (i.e. a punch tool applying a force, a heating source operable to heat said tool, simultaneously apply force) given no patentable weight in determining the patentability of the final device structure.

Note that a Aproduct by process≡ claim is directed to the product per se, no matter how actually made, In re Hirao 190 USPQ 15 at 17(footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessman, 180 USPQ 324; In re Avery, 186 USPQ 161 and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in Aproduct by process≡ claims, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in Aproduct by process≡ claims or not.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al.

The claims recite an approximate value of 50 microns for the thickness of the substrate. The substrate of Ohno is 40 microns obviously considered in the "approximate" value recited.

Claims 1- 5, 7-14 are rejected.

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 15-20 are considered allowable over the prior art of record.

Applicant's arguments filed 12-23-2004 have been fully considered but they are not persuasive. Applicant's arguments appear to be primarily based his view that the TAB bump sheet of Ohno in which the applicant contends is made of poyimide film cannot be construed or be equivalent to a BGA substrate. A BGA or Ball Grid Array is merely substrate with a grid of balls (i.e. may be solder of other material) underneath (see attached sheet with definition) in which a chip may be placed thereon. BGA can certainly be formed of TAB technology and therefore may be formed of polymer tape see the Farnworth et al reference (used only to as teaching tool) who shows use of TAB ball grid array (col.3, line 13). The technology used by Ohno et al shows BGA and is therefore rightly applicable to teach Ball Grid Array technology and does teach the features as they are recited in the claims substantially item for item.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication should be directed to S. V. Clark at  
telephone number (571) 272-1725.

A handwritten signature in black ink, appearing to read 'S. V. Clark', with a stylized, flowing script.

S. V. Clark  
Primary Examiner  
Art Unit 2815

April 1, 2005